

Rejections Under 35 U.S.C. § 103

Claims 1-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shirota '107 or Ito '368 in view of Hermann (Figure 6) and optionally Kajitani. The claims of the present invention define a cooling heat exchanger that is disposed in a case in an inclined position. The inclined position is in the same direction as the longitudinal direction of the tubes. Thus, condensed water from the cooling heat exchanger moves along the tubes to the lower end of the cooling heat exchanger. The movement or flow of water is improved by inclining the cooling heat exchanger in this direction since it allows the tubes to act as a type of conduit or route for the water. As discussed in the specification and illustrated in Figures 6A and 6B, this orientation of the cooling heat exchanger is known in the art.

The claims of the present invention then define the air flow direction of the air being pushed through the heat exchanger as being approximately perpendicular to the longitudinal direction of the tubes and generally parallel to the cooling heat exchanger. This unique orientation of the components and air flow shifts the high-air-pressure area (E) of the blown air from a position along the entire lower end of the heat exchanger to a position at one lower corner of the heat exchanger. This repositioning of the high-air-pressure area (E) significantly improves the flow of condensed water on the cooling heat exchanger.

The Examiner states that Shirota '107 and Ito '368 show all of the patentable features except the introduction of air along the side of the evaporator. Shirota and Ito show air being introduced at the longitudinal end of the evaporator where the upper head is located. This is the same system that is shown in "Prior Art" Figures 6A and 6B and the exact configuration which the present invention improves upon.

The Examiner then turns to Hermann (Figure 6) and optionally Kajitani, to reorient the direction of air flow in Shirota and Ito. In Hermann, the air flow direction is parallel to the longitudinal direction of the tubes not perpendicular. The Examiner has stated that he is at a loss as to how Applicants can make this factual assertion. In Hermann at Column 7, lines 22-24, it states "The heat exchangers may be of any type currently used for the transfer of heat,

however, a tube and fin type is preferred for this design". Thus, we know that the tube and fin type is the preferred embodiment. Then, when we look at Figure 9 which is described as "a partially exploded view of the air handler of the present invention showing the face panel separated from the cabinet", we see a plurality of horizontal lines which are parallel to the air flow direction not perpendicular. In a tube and fin heat exchanger, the preferred embodiment, these horizontal lines can only be interpreted as the longitudinal direction of the tubes since there are no other features of a tube and fin heat exchanger which extend longitudinally the entire length of the heat exchanger. Since the application or patent is taken in its entirety, including the drawings, to define the invention the horizontal lines of Figure 9 can only be used to support Applicant's position and these lines clearly teach away from the Examiner's position.

Regarding Kajitani, the arrows in each of the figures depict the air flow. Thus, in Figure 1, the air flow INTO the heat exchanger comes from the top, in Figure 2, left side, the air flow INTO the heat exchanger comes from the top and in Figure 2, right side, the air flow INTO the heat exchanger comes from the right side. Due to the tilted nature of the heat exchanger, this air flow INTO the heat exchanger could not be defined as being "approximately perpendicular to the longitudinal direction of the tubes" as is defined in the claims. In order to better define the present invention, Applicants have added the limitation that the air flow INTO the heat exchanger is "generally parallel to the heat exchanger". This, along with the "approximately perpendicular" limitation, clearly distinguish over Kajitani. If the air flow in Kajitani is defined as "approximately perpendicular" to the tubes, then it is also approximately perpendicular, not generally parallel, to the heat exchanger.

Thus, Applicant believes independent Claims 1 and 8, as amended, as well as dependent Claims 2-7 and 9-24 which ultimately depend from Claims 1 or 8, patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

New Claims

New Claims 25-28 are depended claims which ultimately depend from Claim 1 and are thus believed to be allowable.

JA 10-244820

Pursuant to the Examiner's request, enclosed is a translation of the JA 10-244820 reference.

PCT JP 98/03586

Pursuant to the Examiner's request, enclosed is a translation of the PCT JP 98/03586 application. Also enclosed is a certified copy of the PCT/JP98/3586 application.

JP-9-216539

Pursuant to the Examiner's request, enclosed is a translation of the JP 9-216539 application. The sideways flow of the air with respect to the cooling heat exchanger is on page 29 in the second paragraph of section [0058]. Here it states "However, air may pass through the evaporator 21, after flowing from a face side to a back side of the paper in FIG. 7." Accordingly, we believe the priority date of the present invention is August 11, 1997.

In light of the above amendments and remarks, Applicant would submit that all Claims are in a condition for allowance and thus Applicant requests that the Examiner pass the case to issue at his earliest possible convenience.

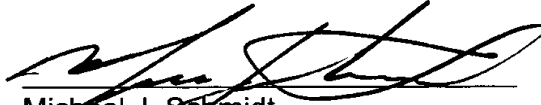
Should the Examiner have any questions regarding the present amendment he should not hesitate to contact the undersigned at (248) 641-1600.

Respectfully submitted,

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Date


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